

In re Patent Application of:
YOUNGBLOOD
Serial No. 09/909,183
Filing Date: JULY 19, 2001

IN THE CLAIMS:

1. - 43. (Cancelled)

44. (new) A subscriber line interface circuit (SLIC) comprising:

a tip amplifier having a tip amplifier output that couples a tip amplifier output current to a tip portion of a subscriber loop;

a ring amplifier having a ring amplifier output that couples a ring amplifier output current to a ring portion of said subscriber loop;

a tip amplifier output current limit circuit, which is operative to monitor said tip amplifier output current, and to controllably limit said tip amplifier output current, exclusive and irrespective of said ring amplifier output current, in accordance with at least one programmable tip amplifier output current limit therefor; and

a ring amplifier output current limit circuit, which is operative to monitor said ring amplifier output current, and to controllably limit said ring amplifier output current, exclusive and irrespective of said tip amplifier output current, in accordance with at least one programmable ring amplifier output current limit therefor.

45. (new) The SLIC according to claim 44, wherein said tip amplifier output current limit circuit is operative to monitor at least one of a tip amplifier source current and a tip amplifier sink current, and to controllably limit said at least one of said tip amplifier source current and said tip amplifier sink current,

In re Patent Application of:
YOUNGBLOOD
Serial No. 09/909,183
Filing Date: JULY 19, 2001

in accordance with said at least one programmable tip amplifier output current limit therefor and exclusive and irrespective of a ring amplifier source current and a ring amplifier sink current, and wherein said ring amplifier output current limit circuit is operative to monitor at least one of said ring amplifier source current and said ring amplifier sink current, and to controllably limit said at least one of said ring amplifier source current and said ring amplifier sink current, in accordance with said at least one programmable ring amplifier output current limit therefor and exclusive and irrespective of said tip amplifier source current and said tip amplifier sink current.

46. (new) The SLIC according to claim 44, wherein said tip amplifier output current limit circuit is operative to monitor both said tip amplifier source current and said tip amplifier sink current, and to controllably limit both said tip amplifier source current and said tip amplifier sink current, in accordance with said at least one programmable tip amplifier output current limit therefor and exclusive and irrespective of said ring amplifier source current and said ring amplifier sink current, and wherein said ring amplifier output current limit circuit is operative to monitor both said ring amplifier source current and said ring amplifier sink current, and to controllably limit both said ring amplifier source current and said ring amplifier sink current, in accordance with said at least one programmable ring amplifier output current limit therefor and exclusive and irrespective of said tip amplifier source current and said tip amplifier sink

In re Patent Application of:
YOUNGBLOOD
Serial No. 09/909,183
Filing Date: JULY 19, 2001

current.

47. (new) The SLIC according to claim 44, wherein said tip amplifier output current limit circuit is operative to individually monitor said tip amplifier source current and to limit said tip amplifier source current in accordance with a relationship between said tip amplifier source current and a programmable tip amplifier source current limit therefor and exclusive and irrespective of said ring amplifier source current and said ring amplifier sink current, and to individually monitor said tip amplifier sink current and to limit said tip amplifier sink current in accordance with a relationship between said tip amplifier sink current and a programmable tip amplifier sink current limit therefor and exclusive and irrespective of said ring amplifier source current and said ring amplifier sink current, and wherein said ring amplifier output current limit circuit is operative to individually monitor said ring amplifier source current and to limit said ring amplifier source current in accordance with a relationship between said ring amplifier source current and a programmable ring amplifier source current limit therefor and exclusive and irrespective of said tip amplifier source current and said tip amplifier sink current, and to individually monitor said ring amplifier sink current and to limit said ring amplifier sink current in accordance with a relationship between said ring amplifier sink current and a programmable ring amplifier sink current limit therefor and exclusive and irrespective of said tip amplifier source current and said tip amplifier sink current.

In re Patent Application of:
YOUNGBLOOD
Serial No. 09/909,183
Filing Date: JULY 19, 2001

48. (new) The SLIC according to claim 47, wherein said programmable tip amplifier sink current limit is higher than said programmable tip amplifier source current limit, and wherein said programmable ring amplifier sink current limit is higher than said programmable ring amplifier source current limit.

49. (new) The SLIC according to claim 48, wherein said programmable tip amplifier sink current limit is on the order of twenty percent higher than said programmable tip amplifier source current limit, and wherein said programmable ring amplifier sink current limit is on the order of twenty percent higher than said programmable ring amplifier source current limit.

50. (new) The SLIC according to claim 44, further including a direct current (DC) limit circuit, coupled to said tip amplifier output and said ring amplifier output, and being operative to limit DC current through said subscriber loop to a prescribed DC current limit; and wherein

said tip amplifier output current limit circuit is operative to controllably limit a tip amplifier transient output current in accordance with a programmable tip amplifier transient output current limit which is higher than said prescribed DC current limit, and said ring amplifier output current limit circuit is operative to controllably limit a ring amplifier transient output current in accordance with a programmable ring amplifier transient output current limit which is higher than said prescribed DC

In re Patent Application of:
YOUNGBLOOD
Serial No. 09/909,183
Filing Date: JULY 19, 2001

current limit.

51. (new) The SLIC according to claim 50, wherein said programmable tip amplifier transient output current limit is on the order of but less than fifty percent higher than said prescribed DC current limit, and wherein said programmable ring amplifier transient output current limit is on the order of but less than fifty percent higher than said prescribed DC current limit.

52. (new) A subscriber line interface circuit (SLIC) comprising:

a tip amplifier having a tip amplifier output that couples a tip amplifier output current to a tip portion of a subscriber loop;

a ring amplifier having a ring amplifier output that couples a ring amplifier output current to a ring portion of said subscriber loop;

a direct current (DC) limit circuit, coupled to said tip amplifier output and said ring amplifier output, and being operative to limit DC current through said subscriber loop to a prescribed DC current limit;

a tip amplifier transient output current limit circuit, which is operative to monitor said tip amplifier output current, and to controllably limit said tip amplifier output current, exclusive and irrespective of said ring amplifier output current, in accordance with at least one programmable tip amplifier output current limit therefor; and

a ring amplifier transient output current limit circuit, which

In re Patent Application of:
YOUNGBLOOD
Serial No. 09/909,183
Filing Date: JULY 19, 2001

is operative to monitor said ring amplifier output current, and to controllably limit said ring amplifier output current, exclusive and irrespective of said tip amplifier output current, in accordance with at least one programmable ring amplifier output current limit therefor.

53. (new) The SLIC according to claim 52, wherein said tip amplifier transient output current limit circuit is operative to monitor at least one of a tip amplifier source current and a tip amplifier sink current, and to controllably limit said at least one of said tip amplifier source current and said tip amplifier sink current, in accordance with said at least one programmable tip amplifier output current limit therefor and exclusive and irrespective of a ring amplifier source current and a ring amplifier sink current, and wherein said ring amplifier transient output current limit circuit is operative to monitor at least one of said ring amplifier source current and said ring amplifier sink current, and to controllably limit said at least one of said ring amplifier source current and said ring amplifier sink current, in accordance with said at least one programmable ring amplifier output current limit therefor and exclusive and irrespective of said tip amplifier source current and said tip amplifier sink current.

54. (new) The SLIC according to claim 52, wherein said tip amplifier transient output current limit circuit is operative to monitor both said tip amplifier source current and said tip

In re Patent Application of:
YOUNGBLOOD
Serial No. 09/909,183
Filing Date: JULY 19, 2001

amplifier sink current, and to controllably limit both said tip amplifier source current and said tip amplifier sink current, in accordance with said at least one programmable tip amplifier output current limit therefor and exclusive and irrespective of said ring amplifier source current and said ring amplifier sink current, and wherein said ring amplifier transient output current limit circuit is operative to monitor both said ring amplifier source current and said ring amplifier sink current, and to controllably limit both said ring amplifier source current and said ring amplifier sink current, in accordance with said at least one programmable ring amplifier output current limit therefor and exclusive and irrespective of said tip amplifier source current and said tip amplifier sink current.

55. (new) The SLIC according to claim 52, wherein said tip amplifier transient output current limit circuit is operative to individually monitor said tip amplifier source current and to limit said tip amplifier source current in accordance with a relationship between said tip amplifier source current and a programmable tip amplifier source current limit therefor and exclusive and irrespective of said ring amplifier source current and said ring amplifier sink current, and to individually monitor said tip amplifier sink current and to limit said tip amplifier sink current in accordance with a relationship between said tip amplifier sink current and a programmable tip amplifier sink current limit therefor and exclusive and irrespective of said ring amplifier source current and said ring amplifier sink current, and wherein

In re Patent Application of:
YOUNGBLOOD
Serial No. 09/909,183
Filing Date: JULY 19, 2001

said ring amplifier transient output current limit circuit is operative to individually monitor said ring amplifier source current and to limit said ring amplifier source current in accordance with a relationship between said ring amplifier source current and a programmable ring amplifier source current limit therefor and exclusive and irrespective of said tip amplifier source current and said tip amplifier sink current, and to individually monitor said ring amplifier sink current and to limit said ring amplifier sink current in accordance with a relationship between said ring amplifier sink current and a programmable ring amplifier sink current limit therefor and exclusive and irrespective of said tip amplifier source current and said tip amplifier sink current.

56. (new) The SLIC according to claim 55, wherein said programmable tip amplifier sink current limit is higher than said programmable tip amplifier source current limit, and wherein said programmable ring amplifier sink current limit is higher than said programmable ring amplifier source current limit.

57. (new) The SLIC according to claim 56, wherein said programmable tip amplifier sink current limit is on the order of twenty percent higher than said programmable tip amplifier source current limit, and wherein said programmable ring amplifier sink current limit is on the order of twenty percent higher than said programmable ring amplifier source current limit.

In re Patent Application of:
YOUNGBLOOD
Serial No. 09/909,183
Filing Date: JULY 19, 2001

58. (new) The SLIC according to claim 52, wherein said tip amplifier transient output current limit circuit is operative to controllably limit a tip amplifier transient output current in accordance with a programmable tip amplifier transient output current limit, which is higher than said prescribed DC current limit, and wherein said ring amplifier output current limit circuit is operative to controllably limit a ring amplifier transient output current in accordance with a programmable ring amplifier transient output current limit, which is higher than which is higher than said prescribed DC current limit.

59. (new) The SLIC according to claim 58, wherein said programmable tip amplifier transient output current limit is on the order of but less than fifty percent higher than said prescribed DC output current limit, and wherein said programmable ring amplifier transient output current limit is on the order of but less than fifty percent higher than said prescribed DC output current limit.

60. (new) A method for limiting a tip amplifier output current applied by a tip amplifier of a subscriber line interface circuit (SLIC) to a tip portion of a subscriber loop, and for limiting a ring amplifier output current applied by a ring amplifier of said SLIC to a ring portion of said subscriber loop, comprising the steps of:

(a) monitoring said tip amplifier output current, and controllably limiting said tip amplifier output current, exclusive and irrespective of said ring amplifier output current, in

In re Patent Application of:
YOUNGBLOOD
Serial No. 09/909,183
Filing Date: JULY 19, 2001

accordance with at least one programmable tip amplifier output current limit therefor; and

(b) monitoring said ring amplifier output current, and controllably limiting said ring amplifier output current, exclusive and irrespective of said tip amplifier output current, in accordance with at least one programmable ring amplifier output current limit therefor.

61. (new) The method according to claim 60, wherein

step (a) comprises monitoring at least one of a tip amplifier source current and a tip amplifier sink current, and controllably limiting said at least one of said tip amplifier source current and said tip amplifier sink current, in accordance with said at least one programmable tip amplifier output current limit therefor and exclusive and irrespective of a ring amplifier source current and a ring amplifier sink current, and wherein

step (b) comprises monitoring at least one of said ring amplifier source current and said ring amplifier sink current, and controllably limiting said at least one of said ring amplifier source current and said ring amplifier sink current, in accordance with said at least one programmable ring amplifier output current limit therefor and exclusive and irrespective of said tip amplifier source current and said tip amplifier sink current.

62. (new) The method according to claim 60, wherein

step (a) comprises monitoring both said tip amplifier source current and said tip amplifier sink current, and controllably

In re Patent Application of:
YOUNGBLOOD
Serial No. 09/909,183
Filing Date: JULY 19, 2001

limiting both said tip amplifier source current and said tip amplifier sink current, in accordance with said at least one programmable tip amplifier output current limit therefor and exclusive and irrespective of said ring amplifier source current and said ring amplifier sink current, and wherein

step (b) comprises monitoring both said ring amplifier source current and said ring amplifier sink current, and controllably limiting both said ring amplifier source current and said ring amplifier sink current, in accordance with said at least one programmable ring amplifier output current limit therefor and exclusive and irrespective of said tip amplifier source current and said tip amplifier sink current.

63. (new) The method according to claim 60, wherein

step (a) comprises individually monitoring said tip amplifier source current and limiting said tip amplifier source current in accordance with a relationship between said tip amplifier source current and a programmable tip amplifier source current limit therefor and exclusive and irrespective of said ring amplifier source current and said ring amplifier sink current, and individually monitoring said tip amplifier sink current and limiting said tip amplifier sink current in accordance with a relationship between said tip amplifier sink current and a programmable tip amplifier sink current limit therefor and exclusive and irrespective of said ring amplifier source current and said ring amplifier sink current, and wherein

step (b) comprises individually monitoring said ring amplifier

In re Patent Application of:
YOUNGBLOOD
Serial No. 09/909,183
Filing Date: JULY 19, 2001

source current and limiting said ring amplifier source current in accordance with a relationship between said ring amplifier source current and a programmable ring amplifier source current limit therefor and exclusive and irrespective of said tip amplifier source current and said tip amplifier sink current, and individually monitoring said ring amplifier sink current and limiting said ring amplifier sink current in accordance with a relationship between said ring amplifier sink current and a programmable ring amplifier sink current limit therefor and exclusive and irrespective of said tip amplifier source current and said tip amplifier sink current.

64. (new) The method according to claim 63, wherein said programmable tip amplifier sink current limit is higher than said programmable tip amplifier source current limit, and wherein said programmable ring amplifier sink current limit is higher than said programmable ring amplifier source current limit.

65. (new) The method according to claim 64, wherein said programmable tip amplifier sink current limit is on the order of twenty percent higher than said programmable tip amplifier source current limit, and wherein said programmable ring amplifier sink current limit is on the order of twenty percent higher than said programmable ring amplifier source current limit.

66. (new) The method according to claim 60, further including the step of:

In re Patent Application of:
YOUNGBLOOD
Serial No. 09/909,183
Filing Date: JULY 19, 2001

(c) limiting DC current through said subscriber loop to a prescribed DC current limit, and wherein

step (a) comprises controllably limiting a tip amplifier transient output current in accordance with a programmable tip amplifier transient output current limit which is higher than said prescribed DC current limit, and

step (b) comprises controllably limiting a ring amplifier transient output current in accordance with a programmable ring amplifier transient output current limit which is higher than said prescribed DC current limit.

67. (new) The method according to claim 66, wherein said programmable tip amplifier transient output current limit is on the order of but less than fifty percent higher than said prescribed DC current limit, and wherein said programmable ring amplifier transient output current limit is on the order of but less than fifty percent higher than said prescribed DC current limit.